SHERWIN-WILLIAMS.

THE SHERWIN-WILLIAMS COMPANY
Environmental, Health & Regulatory Services
101 Prospect Avenue NW
Cleveland, Ohio 44115-1075
Facsimile: (216) 566-2730

February 10, 2010

Mr. Ray Klimcsak
U.S. Environmental Protection Agency – Region 2
290 Broadway 19th Floor
New York, New York 10007-1866

RE: United States Avenue Burn Site
Gibbsboro, New Jersey
Administrative Order Index No. II CERCLA-02-99-2035
Response to EPA and NJDEP Comments on:
"Groundwater Results Evaluation and Proposal for Further Action",
dated August 18, 2009

Dear Mr. Klimcsak:

The Sherwin-Williams Company (Sherwin-Williams) has reviewed the comments provided by the United States Environmental Protection Agency Region 2 New Jersey Remediation Branch (EPA) and the New Jersey Department of Environmental Protection (NJDEP) on the August 18, 2009 "*Groundwater Results Evaluation and Proposal for Further Action*", and is submitting this point-by-point response to the EPA and NJDEP comments.

Attached to this letter is a revised copy of the text of the document, a revised Table 3 which includes the additional information for MW-10, an enlarged version of the inset map (Table 5 – Figure 1) that was originally provided in Table 5, a reference table (Table 7) containing the proposed analyses and analytical methods, a revised Figure 5 – Monitoring Well Location and Surface Water Location Map, and Attachment 6 with the "second" figure 5, which is titled "Burn Site - Groundwater Samples -Round 1 (August 2005) and Round 2 (September/October 2005) - Exceedances (All Parameters)" that is excerpted from the June 19, 2006 report entitled "*Evaluation of Strategic Sampling Results, U.S. Avenue Burn Site and Associated Reaches of Honey Run and White Sands Branch*".

Response to Comments

Presented below are Sherwin-Williams' responses to the EPA and NJDEP comments. The comments are presented in *italics*, followed by the Sherwin-Williams response.

General Comments

General Comment 1. *Please add the location of MW-40 to all the drawings and maps. There is considerable discussion of this well, but it is only shown on two of the maps.*

282384

Response: Figures 2, 3 and 4 are groundwater contour maps that depict groundwater flow direction in the shallow wells only. These wells have a total depth less than 20 feet below ground surface (bgs). MW-40 is a deep well (73 feet bgs) and is therefore not depicted on the three shallow groundwater contour maps (Figures 2, 3 and 4) referenced above.

MW-40 is depicted on Figure 1 – Monitoring Well Location Map and Figure 5 – Proposed Monitoring Well Location Map, on which it is appropriate to show its location relative to the other wells.

General Comment 2. EPA agrees that the best slug test results are from the Bouwer and Rice method.

Response: Sherwin-Williams will use the Bouwer and Rice method for future site-specific calculations (e.g., seepage velocity) which require an estimated hydraulic conductivity parameter. Depending upon the use of the calculation, either well-specific arithmetic mean values or site-specific geometric mean values may be applied.

General Comment 3. The best map to illustrate the conceptual hydrogeology model is the small inset map (figure) shown on Table 5. EPA is requesting that this figure be enlarged and would recommend that it be used to prepare a section on the site conceptual model and transport pathways. The transport of contaminated water is likely occurring via surface water and base-flow in the aquifer as it passes under the railroad tracks.

Response: A larger version of this map has been included with this response and is referenced as Table 5 – Figure 1 in the revised text. Once the proposed additional wells are installed, developed, sampled and their hydraulic characteristics calculated, additional evaluation regarding the conceptual site model and contaminant transport pathways will be presented to EPA.

General Comment 4. EPA agrees with the well locations, depths, and rationales of the proposed wells. One of the transport pathways, however, is via surface water. It is recommended that two surface water samples be collected to correspond with future groundwater sampling. One sample should be at the confluence of the two streams, just above the railroad tracks. One sample should be at the outflow into Bridgewood Lake on the other side of the railroad tracks. It is likely that the culvert which transports the surface water under the railroad tracks gains flow from groundwater influence. This groundwater gain may be affected with chemistry from the Sites.

Response: Sherwin-Williams had previously collected unfiltered surface water samples at the above-referenced locations at the Burn Site and Bridgewood Lake during the 2005 investigation activities. Sample WSDW0001 was collected at the confluence of White Sand Branch and Honey Run before they exit the Burn Site (above the railroad tracks), and BWDW0010 was collected at the outflow into Bridgewood Lake on the other side of the railroad tracks. These locations are depicted on Figure 5 – Proposed Monitoring Well Location and Surface Water Location Map.

Sherwin-Williams will collect surface water samples at the above-referenced EPA-recommended locations during the sampling round for the newly-proposed monitoring wells. Both filtered and unfiltered samples will be collected at WSDW0001 and BWDW0010 and analyzed for Target Compound List (TCL) Volatile Organic Compounds (VOCs), TCL Semivolatile Organic Compounds (SVOCs), TAL Metals plus cyanide, TCL Pesticides, Total Organic Carbon (TOC), Total Dissolved Solids (TDS), Total Suspended Solids (TSS), hardness (as $CaCO_3$) and pH.

<u>General Comment 5.</u> *It should be noted that the stream stage measurements depicted on Figure 4 do not match the stream stage as shown by the topography contours. Please be mindful of this when preparing groundwater maps. It is customary to use the point where a topo line crosses a stream as the stage of the stream, thus the elevation of the groundwater as well. In this case, it appears that there is a bit of error in the topo.*

<u>Response:</u> The stream stage measurements are based on actual measurements relative to benchmarks. It should be noted that there are relatively steep banks along the course of the stream that may not be accurately reflected in the topographic mapping.

<u>Specific Comments</u>

<u>Specific Comment 1.</u> *Introduction, First paragraph, page 1 – Please provide the specific date and title of the "summary report" that is referenced in this paragraph. In addition, the statement that, "At that time, the EPA deferred responding to the proposal for additional groundwater investigation." is inaccurate. Please note, EPA requested additional information to the 3 deep wells originally proposed. See Page 11, of the September 24, 2007 Response to EPA's Comments (January 18, 2007) on the Sherwin-Williams (June 19, 2006) Strategic Evaluation Proposal. The Sherwin-Williams Company subsequently submitted the requested information in 2008 and was later revised in 2009.*

<u>Response:</u> The summary report referenced in the above-mentioned comment is entitled "*Evaluation of Strategic Sampling Results, U.S. Avenue Burn Site and Associated Reaches of Honey Run and White Sands Branch*" dated June 19, 2006. This has been added to the revised text.

<u>Specific Comment 2.</u> *Introduction, Second paragraph, page 1 – It is stated that all new wells (7 shallow at the Burn Site and 2 at the Rail Road Site) were developed. On Page 4 it is stated that all development water was containerized and disposed of off-site. Please verify that this was indeed true. Although it is likely that drill cuttings and*

personal protective equipment (PPE) were collected and disposed of, EPA does not recall that purge water was. In addition, please verify what will be done with future purge water, drill cuttings and PPE. During monitoring well installation at the Route 561 Dump Site, all purge water was discharged to the ground surface.

Response: All development and purge water for the initial development and sampling activities conducted in 2005 were containerized and disposed off-site.

For all future development or purging activities performed for existing or newly-installed monitoring wells at the Burn Site, the purge water generated in the field will be discharged to the ground adjacent to the monitoring well in accordance with the NJDEP Field Sampling Procedures Manual.

Specific Comment 3. Introduction, Third paragraph, page 1 – Although slug tests were discussed in this evaluation report, please be aware that page 5-6 of the approved 2003 Remedial Investigation/Feasibility Study (RI/FS) Work Plan states that one water table and one deeper well will be pump-tested.

Response: Upon completion of the proposed well installations, development, sampling and slug-testing activities, the hydraulic characteristics will be calculated and evaluated. At that time, one water table well and one deeper well will be proposed for pump-testing, if deemed appropriate after evaluation.

Specific Comment 4. Section 2.2, first paragraph, page 3 – Please remove reference to the following terminology, "Phase IV investigation at the Paint Works". Citing the date that the monitoring well was installed is sufficient. As a suggestion, it would be appropriate to state that the monitoring well was installed by the Sherwin-Williams Company under a previous Administrative Order with the NJDEP.

Response: The sentence has been revised as requested.

Specific Comment 5. Please include a table which presents the specific analytical methods to be utilized for the analyses that are presented on Page 20.

Response: A table presenting the specific analytical methods for the proposed analyses is included with this submission. It is referenced as Table 7 – Proposed Analytical Methods in the revised text.

Specific Comment 6. Table 3 – Please include the information for MW-10. If it is not available, please state why in the appropriate section of the text. Please note, information is cited in the figures for this well.

Response: The information for MW-10 was inadvertently omitted from Table 3 in the initial submission. This information has been added and the revised table is included with this submission.

Specific Comment 7. There are two figures labeled number five, please correct.

Response: The "second" figure 5, which is titled "Burn Site - Groundwater Samples - Round 1 (August 2005) and Round 2 (September/October 2005) - Exceedances (All Parameters)" is excerpted from the June 19, 2006 report entitled "*Evaluation of Strategic Sampling Results, U.S. Avenue Burn Site and Associated Reaches of Honey Run and White Sands Branch*". Its intent was to correct a transposition error noted in the original June 19, 2006 submission. The same figure number was used to maintain continuity with the original report in which it appeared in order to allow the reviewer to replace the figure, if so desired. It will be correctly included in the appropriate Attachment 6 section as referenced in the document, instead of being included in the Figure section.

To clarify, Figures 1, 5, and 6 of the Jun 19, 2006 document have the well locations BSMW0005 and BSMW0007 and associated data inadvertently transposed. BSMW0005 is actually located along the fence line adjacent to United States Avenue; and BSMW0007 is actually located south of Honey Run at the southeast boundary of the Burn site. This corrected Figure 5 (dated 08/14/09) showing the revised well locations and associated data is included as Attachment 6 with this submission.

Should you have any other recommendations or if you have any questions or comments, please do not hesitate to contact me at (216) 566-1794 or via e-mail at mlcapichioni@sherwin.com.

Sincerely,

Mary Lou Capichioni

Mary Lou Capichioni
Director Remediation Services

Attachment
cc: J. Josephson, EPA (New York)
W. Sy, EPA (Edison)
J. Doyon, NJDEP (4 copies)
P. Parvis, HDR
J. Gerulis, Sherwin-Williams (w/o enclosures)
A. Danzig, Sherwin-Williams (w/o enclosures)
S. Peticolas, Gibbons, Del Deo, Dolan, Griffinger, & Vecchione (w/o enclosures)
H. Martin, ELM
R. Mattuck, Gradient
S. Jones, Weston Solutions
S. Clough, Weston Solutions
A. Fischer, Weston Solutions

GROUNDWATER INVESTIGATION

This "Revised Groundwater Results Evaluation and Proposal for Further Action, United States Avenue Burn Site", is being submitted to the United States Environmental Protection Agency, Region 2 New Jersey Remediation Branch (EPA) in a similar format and with similar content to that included in the April 2009 Technical Memorandum responding to the EPA comments regarding the groundwater sampling and evaluation of groundwater conditions at The Sherwin-Williams Company (Sherwin-Williams) Route 561 Dump Site. This submittal provides a summary of the investigation activities conducted at the Burn Site, presents an evaluation of the current understanding of site geology and hydrogeology, summarizes the groundwater data that have been collected, and, based on the current understanding of groundwater conditions, proposes the installation of additional monitoring wells.

The proposed scope of work also incorporates EPA suggestions for the groundwater investigation at the Former Manufacturing Plant (FMP) site. Several of the wells installed at the Burn Site are more than 20 years old, and, as part of this scope of work, will be redeveloped prior to sampling.

1.0 BACKGROUND

During the Remedial Investigation (RI) conducted during Summer 2005, groundwater investigation activities were performed at the United States Avenue Burn Site (Burn Site) and the adjacent Rail Road Site. Even though these two sites are physically separated by United States Avenue, they have been combined into one hydrogeologic entity due to their close proximity. Following the completion of the field work, a summary report entitled "*Evaluation of Strategic Sampling Results, U.S. Avenue Burn Site and Associated Reaches of Honey Run and White Sands Branch*" dated June 19, 2006 was submitted to the EPA along with a proposal for the installation of additional groundwater monitoring wells. In EPA's comments dated January 18, 2007, it was requested that Sherwin-Williams provide additional information, including an evaluation of groundwater flow direction, incorporating surface water levels, and an assessment of the site hydrogeology. Sherwin-Williams subsequently submitted the requested information in a Technical Memorandum entitled *"United States Avenue Burn Site – Groundwater Results Evaluation and Proposal for Further Action"* dated August 18, 2009. EPA requested additional information in their comments dated January 6, 2010, and this revised document incorporates the requested information.

2.0 INTRODUCTION

Seven shallow monitoring wells were installed, developed, and sampled at the Burn Site, and two shallow monitoring wells were installed, developed and sampled at the adjacent Rail Road Site. Four existing shallow monitoring wells (MW-7, MW-8, MW-9 and MW-10) at the Burn Site were also sampled as part of the RI activities. All development and purge water for the initial development and sampling activities conducted in 2005 were containerized and disposed off-site.

Slug tests were performed at each of the newly installed wells in order to develop an estimate of hydraulic conductivity and seepage velocity, and groundwater elevation measurements were collected from all existing and newly-installed wells to obtain information regarding groundwater flow direction and horizontal hydraulic gradients. Water level measurements were obtained from an existing deep groundwater monitoring well (MW-40), but no groundwater sampling was conducted. The following is a compilation and description of the activities performed.

3.0 SUMMARY OF DRILLING AND MONITORING WELL INSTALLATION ACTIVITIES, 1981 - 2005

Groundwater monitoring wells were installed in the Burn Site in June 1981, November 1999, and June/July 2005 as part of three separate phases of investigation. The monitoring well locations are presented on Figure 1.

This section provides a summary of both the historic monitoring well installation activities and the most recent monitoring well installations performed in 2005. A summary of monitoring well construction details is provided in Table 1. Soil boring logs and monitoring well construction logs are provided in Attachment 1. Copies of the Monitoring Well Permit (DWR-133M), Monitoring Well Records, and Monitoring Well Certifications (Form A) are provided in Attachment 2.

The three monitoring well installation events are summarized below.

3.1 Monitoring Well Installation - 1981

Auger techniques were used to install four shallow monitoring wells (MW-7, MW-8, MW-9, and MW-10) on June 3, 1981. At the time of installation, monitoring wells MW-7, MW-8, and MW-9 were originally named MW-12, MW-13, and MW-11, respectively. These wells were renamed some time prior to 1997, and the more recent nomenclature continues to be used. Monitoring well MW-10 has not been renamed since the time it was originally installed.

The wells were installed by New Jersey licensed Craig Test Boring Company, Inc. of Mays Landing, New Jersey. Monitoring wells were installed in a 12-inch-diameter boring and were constructed of 4-inch-diameter, schedule-40 polyvinyl chloride (PVC) well screens and riser pipes. The well screens were 10 feet in length with a 0.020-inch (20-slot) slot size. Monitoring wells MW-7, MW-8, and MW-10 were screened 5'-15' below ground surface (bgs). Monitoring well MW-9 was screened 10'-20' bgs. All wells were finished above grade using protective steel stick-up outer casings.

According to the well driller's log, five feet and eight feet of fill were encountered below ground surface during well installation at MW-7 and MW-9, respectively. No fill was logged at MW-8 and MW-10. Dark brown (MW-7) and dark gray (MW-9) fine sand and some silt were logged below the fill to a depth of 15 feet and 20 feet bgs, respectively.

Where fill was not present, yellow (MW-8) and light gray (MW-10) fine sand and some silt were logged in the upper 15 feet bgs.

3.2 Monitoring Well Installation – 1999

On November 8, 1999, mud-rotary drilling techniques were used to install deep monitoring well MW-40. Monitoring well MW-40 was installed by James C. Anderson Associates, Inc. of Moorestown, New Jersey.

An 8-inch carbon steel isolation casing (from surface to 53 feet bgs) was grouted into a silty clay confining unit. The monitoring well was constructed of 4-inch-diameter, schedule-40 PVC well screen and riser pipes. The well screen was 10 feet in length with a 0.010-inch (10-slot) slot size. The screen was set from 60 to 70 feet bgs, immediately below what was reported as a confining silty clay. Monitoring well MW-40 was finished above grade using a protective steel stick-up outer casing.

According to the driller's monitoring well record (Attachment 1), mixtures of light and medium brown, yellowish, and orange silty sand were encountered to a depth of 44 feet bgs. An orange to light red silty clay was present from 44 to 56 feet bgs. A dark gray to green-black silty clay was logged between 56 and 60 feet bgs. From 60 to 70 feet bgs a dark green to black silty fossiliferous sand was noted.

3.3 Monitoring Well Installation – 2005

Between June 16 and July 21, 2005, nine shallow monitoring wells were installed. Seven of these wells were at the Burn Site (BSMW0001, BSMW0002, BSMW0003, BSMW0004, BSMW0005, BSMW0006 and BSMW0007), and two of these wells were at the Rail Road Site (RRMW0001 and RRMW0002). The drilling and monitoring well installation were conducted by East Coast Drilling, Inc. (ECDI) of Moorestown, New Jersey. ECDI is a New Jersey-licensed driller (New Jersey License No. M1224). All drilling and monitoring well work was performed under supervision of trained and experienced Weston Solutions, Inc. (Weston®) personnel.

All Burn Site and Rail Road Site well borings were advanced by ECDI with a rubber-tracked model 6610DT Geoprobe® rig capable of hollow-stem auger (HSA) borings. Direct-push technology was used for logging of soil samples from each well location. Drilling was limited to the upper 15 feet bgs. A 5-foot MacroCore® sampler and disposable acetate sleeves were used for collection of all soil samples. All soil samples were inspected and logged by a qualified field geologist and field screened using a photoionization detector (PID). Subsequent to the field activities a soil boring log was created for each boring describing the soil types encountered, visual observations such as staining, and PID readings. No soil samples were collected for laboratory analyses.

Shallow soils (i.e., above 15 feet bgs) encountered in the Burn Site and Rail Road Site predominantly consist of fine to coarse sand and gravel with some clay and silt also present. Detailed lithologic descriptions are presented in the soil boring logs (Attachment 1).

Monitoring wells were installed by over-drilling each soil boring location using 8-inch outside diameter (4.25-inch inside diameter) hollow-stem augers. The monitoring wells were constructed of 2-inch-diameter, schedule-40 polyvinyl chloride (PVC) well screens and riser pipes. The well screens were 10 feet in length and had 0.010-inch (10-slot) slot sizes. The well filter pack was constructed with Morie sand #1 and granulated bentonite was used to create the annular seal above the sand filter pack. The filter packs were placed in the well borehole from approximately 1 foot below or at the bottom of the well screens up to approximately 1 to 2 feet above the screen. A finer Morie sand #00 was used as a choke layer between the filter pack and the bentonite seal. All wells were finished above grade using 6-inch diameter protective steel stick-up outer casings. Sloping concrete pads measuring approximately 2 feet by 2 feet and 4 inches to 6 inches thick were placed around the protective outer casings to seal and secure the wells above ground. All wells were marked with their respective identifications on steel tags held by steel collars around the well outer casings.

4.0 MONITORING WELL DEVELOPMENT

No well development information is available for the 1981 shallow monitoring wells. Deep monitoring well MW-40, installed in 1999, was developed by the driller by pumping at 5 gallons per minute (gpm) for 2 hours.

The 2005 monitoring wells were developed following installation by using a surge block and small submersible pumps (Whale and/or Typhoon pumps). The pump was initially placed at the bottom of the well screen and manually surged up and down at periodic intervals. A portable turbidity meter (LaMotte Model 2020) was used to monitor water turbidity during well development. The turbidity meter was calibrated in the field prior to well development using turbidity standards of 1 and 1,000 nephelometric turbidity units (NTU). Water was collected directly from the dedicated polyethylene pump discharge tubing at 5-minute intervals for turbidity monitoring. The development water was containerized in 55-gallon drums, labeled, and sent off site for disposal.

The monitoring wells were developed until the development water became relatively silt-free and clear based on turbidity readings, or for a maximum of four hours. Only one well in the Burn Site (BSMW0005) reached a final turbidity reading below 10 NTU. The remainder of the wells in the Burn Site and Rail Road Site had final turbidity readings ranging from 14 to 93 NTU. Monitoring wells BSMW0001, BSMW0002, and RRMW0001 were developed on two occasions with final turbidity levels measured as 17, 93, and 26 NTU, respectively. Well development data are summarized in Table 2.

5.0 MONITORING WELL SURVEY

The 2005 monitoring wells were surveyed by T&M Associates, of Moorestown, New Jersey, a New Jersey-licensed surveyor (N.J.P.L.S. No. 32106). Well survey data included all horizontal locations, ground surface elevations, top of inner PVC casing (TIC) elevations, and top of outer protective casing (TOC) elevations. The elevations (NAVD 88) were reported to the nearest 0.01 foot based on first order survey benchmarks. Location coordinates were reported using both the Global Positioning System (GPS) geographic coordinates to the nearest 0.01 second and the New Jersey State Plane Coordinate System (NAD 83) to the nearest 0.01 foot. Monitoring Well Certification Form Bs are included in Attachment 3.

In addition to monitoring wells, Weston sited three elevation control points (designated as Control Monuments [CM]) at strategic locations within the Burn Site to aid in the measurement of surface water elevations along White Sand Branch and Honey Run, which flow into and converge within the Burn Site. Downstream of the convergence, White Sand Branch flows through a culvert under United States Avenue, and discharges into Bridgewood Lake.

The elevation control points used for the Burn Site were located along White Sand Branch (designated CM-09A and B) for the northern portion of the Burn Site and along Honey Run (designated CM-10) for the southern portion of the Burn Site. The control monuments also were surveyed by T&M Associates to establish their horizontal location and vertical elevation. The elevations (NAVD 88) were reported to the nearest 0.01 foot based on first order survey benchmarks. Monument survey location coordinates were reported in both the GPS geographic coordinates to the nearest 0.01 second and the New Jersey State Plane Coordinate System (NAD 83) to the nearest 0.01 foot.

6.0 GROUNDWATER AND SURFACE WATER ELEVATION MEASUREMENTS, 2005 - 2006

Between October 2005 and March 2006, Weston conducted groundwater elevation monitoring events using the Burn Site and Rail Road Site wells. After the elevation control points were designated and surveyed, Weston also conducted an additional round on September 12, 2006 to collect synoptic groundwater and surface water elevation measurements.

A Solinst® oil-water interface probe was used to measure depth to water (DTW) in the monitoring wells. DTW was measured in relation to the wells' TIC. Surface water elevations were obtained in September 2006 at four locations (BS02, BS03, BS04, and BS05) in the Burn Site using a level (David White Model 8824) and survey rod. The surface water elevation was calculated to the nearest 0.01 foot in relation to the elevation of the elevation control point.

Groundwater elevations were calculated by subtracting the measured DTW from the TIC elevation. The shallow groundwater and surface water elevation data were used to construct groundwater contour maps for the Burn Site/Rail Road Site. A summary of the measured depth to water, groundwater elevation, and surface water elevation data for the Burn Site/Rail Road Site is presented in Table 3.

The shallow well soil boring logs indicate the upper 15 feet of the Burn Site/Rail Road Site primarily consists of sand, and there is no potentially confining geologic unit present. Based on the geology seen in the upper 15 feet the shallow groundwater within the Burn Site/Rail Road Site is unconfined. The October 2005 to September 2006 DTW measurements from the 2005 Burn Site monitoring wells found groundwater at depths ranging from 0.1 feet bgs (BSMW0006) to 3.6 feet bgs (BSMW002 and BSMW0004). Seasonally, groundwater fluctuated from 0.4 feet (BSMW0002 and BSMW0007) to 2.3 feet (BSMW0004) during this same time period.

Between October 2005 and September 2006 shallow groundwater at the Rail Road Site ranged from 1.1 feet bgs (RRMW0001) to 2.3 feet bgs (RRMW0002). For the same time period, the seasonal shallow groundwater fluctuation at RRMW0001 and RRMW0002 was 0.7 and 0.4 feet, respectively.

6.1 Shallow Groundwater Contour Maps

The shallow groundwater contours were designed using hand contouring techniques. Surface water elevation data (September 2006 only) were used as control elevation points to aid in the groundwater contour design in the vicinity of creeks and water bodies. Groundwater contour maps for three select events of groundwater monitoring are presented in Figures 2 through 4. The November 2005, January 2006, and September 2006 events were selected because they are representative of expected seasonal fluctuations in shallow groundwater.

Groundwater contour maps from November 2005, January 2006, and September 2006 were used to assess groundwater flow directions and calculate average horizontal hydraulic gradients across the Burn Site/Rail Road Site. Based on the groundwater contour maps, the inferred groundwater flow direction is generally from the north, south, and east perimeters of the Burn Site, towards the axis of the White Sand Branch and Honey Run stream channels, and perpendicular to the topographic contours.

7.0 SITE-SPECIFIC GROUNDWATER HORIZONTAL HYDRAULIC GRADIENT

Based on the site topography, different horizontal hydraulic gradients are present, depending upon the location of the well and its relative location to the other wells and surface water measuring points within the Burn Site, as shown on Figure 2, Figure 3 and Figure 4.

For the purpose of estimating a site specific value, horizontal hydraulic gradients were calculated using various wells and measuring points located throughout the site. The intent is to calculate a gradient from the highest to lowest elevation in a direction parallel to the axis of stream flow and perpendicular to the topography. The elevation data from the September 2006 gauging event were used for these calculations.

Based on horizontal hydraulic gradients obtained from groundwater contour maps, the direction of groundwater flow, and the discharge location, the Burn Site can be separated into three general areas.

- Northern Burn Site Area (White Sand Branch) is limited to the area north of White Sand Branch, where the groundwater flow direction is north to south into White Sand Branch. The range of horizontal hydraulic gradients in this area is approximately 0.003 ft/ft to 0.19 ft/ft. The horizontal hydraulic gradient along the axis of White Sand Branch from measuring point BS-05 (located at the upstream fence line where White Sand Branch enters the Burn Site) to BS-04 (located downstream at the culvert exiting the Burn Site) was calculated to be 0.003 ft/ft for the September 2006 event.

- Western Burn Site Area (United States Avenue) is south of the White Sand Branch and southwest of Honey Run, near the western boundary adjacent to United States Avenue, where the groundwater flow direction is towards the northwest. The horizontal hydraulic gradient in this localized area ranges from 0.008 ft/ft to 0.015 ft/ft.

- Southern Burn Site Area (Honey Run) is limited to south of Honey Run, where the groundwater flow direction is south to north into White Sand Branch. The range of horizontal hydraulic gradients in this area is approximately 0.005 ft/ft to 0.012 ft/ft. The horizontal hydraulic gradient along the axis of Honey Run from measuring point BS-03 (located at the upstream fence line where Honey Run enters the Burn Site) to BS-04 (located downstream at the culvert exiting the Burn Site) was calculated to be 0.005 ft/ft for the September 2006 event.

7.1 Deep Groundwater Geology and Hydrogeology

The MW-40 soil log described a "silty clay" unit present 44 to 60 feet bgs. Soil property testing (presented below) confirmed the fine-grained nature and low hydraulic conductivity of this unit. This silty clay is underlain by a fossiliferous sand unit. MW-40 is screened from 63 to 73 feet bgs and entirely within the deep fossiliferous sand. Based on the geology at MW-40, the groundwater within the deep fossiliferous sand is believed to be present under confined conditions.

Depth-to-groundwater measurements in MW-40 from October 2005 and March 2006 indicate that the potentiometric groundwater surface generally ranged between approximately 1.0 and 2.3 feet bgs; which represents a seasonal deep groundwater fluctuation of approximately 1.3 feet.

The vertical hydraulic gradient between the shallow sand and deep sand groundwater systems cannot be accurately calculated because there are no true monitoring well couplets at the Burn Site/Rail Road Site. However, the October 2005, January 2006, and March 2006 groundwater elevation monitoring events can be used to estimate the direction of the vertical hydraulic gradient between the shallow and the deep sand groundwater systems at the Burn Site. During these events, the estimated water table elevation of the shallow unconfined aquifer in the vicinity of MW-40, was approximately 75 feet above mean sea level (amsl). The actual measured elevation of the deep groundwater system piezometric head at MW-40 during the October 2005, January 2006, and March 2006 events was 78.41 feet, 79.71 feet, and 79.21 feet amsl, respectively. These data consistently support confined conditions within the deep fossiliferous sand and suggest an upward hydraulic gradient between the deep and shallow groundwater systems in the vicinity of MW-40.

Because there is presently only one deep groundwater monitoring well at the Burn Site/Rail Road Site, the deep groundwater apparent flow direction and horizontal hydraulic gradient in this area could not be derived.

7.2 Clay and Silt Layer Soil Property Test Results

During the drilling for deep monitoring well MW-40, a Shelby tube sample was collected from the top of the confining unit and analyzed using ASTM Method D 5084. The liquid limit, plasticity limit, and plasticity index of this upper portion of the confining unit were determined by using ASTM D 4318. Particle size analysis of the upper portion of the confining unit was analyzed by using ASTM D 422. All analyses were performed by Severn Trent Laboratories (STL) in University Park, IL.

Based on three tests, the average hydraulic conductivity of the upper portion of the confining unit was estimated to be approximately 3.0E-07 cm/sec (8.5E-4 ft/day).

The upper portion of the confining unit had liquid limit, plasticity limit, and plasticity index of 35, 17, and 17, respectively. Based on the grain size analyses within the upper portion of the confining unit, the material consists of approximately 15% clay, 47% silt, 33% fine sand, and 5% coarse to medium sand. The cumulative results of these tests indicate the upper portion of the confining unit consists of medium plastic inorganic fine sandy silt (ML), with some clay.

Based on a grain size analysis from the lower portion of the confining unit (53 feet bgs) the deep portion is clayey fine sand (SC), some medium silt, with trace medium and coarse sand.

7.3 Hydraulic Conductivity Tests – Shallow Groundwater System

Single well hydraulic conductivity tests (i.e., slug tests) were performed for all the shallow Burn Site/Rail Road Site wells installed in 2005. The hydraulic testing was conducted in the two Rail Road Site wells on September 7, 2005; and at the seven Burn Site wells on September 8, 2005. At each monitoring well, two rising head and two falling head slug tests were performed to ensure reproducibility.

An In-Situ® miniTROLL® 9000 data logger with a 15 pounds per square inch (PSI) pressure/level and temperature sensors was used to collect continuous water displacement measurements from the monitoring wells. A Solinst® electronic water level meter was used to measure initial depth to groundwater prior to slug testing and determine how far into the water column the slug needed to be lowered. Two slugs (Slug I and Slug II) were constructed for the slug test event. Both consisted of approximately 3-foot-long PVC pipes (1-inch ID, 1.13-inch OD) filled with cement and sealed on both ends with PVC caps. The Slug I volume was calculated to be 53.33 cubic inches (in^3) and the Slug II volume was calculated to be 52.57 in^3. Slug I was used with wells RRMW0001, RRMW0002, BSMW0001, BSMW0003, BSMW0005, BSMW0006 and BSMW0007, and Slug II was used with wells BSMW0002 and BSMW0004.

Groundwater displacements were recorded continuously at one-second intervals, first with the slug placed in (i.e., falling head test) and then with the slug taken out (i.e., rising head test) of the well. This procedure was repeated once (slug-in1, slug-out1, slug-in2 and slug-out2) for each well for verification of data consistency. The slug test data were recorded in real time with the miniTROLL-interfaced palm computer data logger.

Once the field data were collected, aquifer test results were interpreted at Weston's Edison, NJ office using software (Aqtesolv® – v-4.50.002) that provided plots for visual curve-matching of aquifer straight-line solutions to time-displacement data measured during the field tests using various analytical methods that are discussed in the following section.

7.3.1 Shallow Aquifer Hydraulic Conductivity Test Assumptions and Results

Based on site soil boring logs, the shallow aquifer is assumed to be unconfined and isotropic near the surface and with a saturation thickness of approximately 40 feet. The base of the shallow aquifer is considered to be the top of the silty clay observed at 44 feet bgs in MW-40.

Seven (BSMW0001, BSMW0002, BSMW0004, BSMW0005, BSMW0006, BSMW0007, RRMW0002) of the nine 2005 wells installed at the Burn Site/Rail Road Site have a partially submerged screen; so a gravel pack correction using Aqtesolv®'s typical coarse sand effective porosity value of 30% (Morris & Johnson, 1967[1]) was applied during the data analysis to account for drainage from the gravel pack. As applicable, the straight line fit to the second linear segment of the solution was selected for the hydraulic conductivity estimate.

The remaining two wells (BSMW0003 and RRMW0001) have screens fully submerged in the aquifer, so a gravel pack correction for partially submerged screens was not required.

Slug test data were evaluated by five analytical methods including:

---

[1] *Morris, D.A. and A.I.Johnson, 1967. Summary of hydrologic and physical properties of rock and soil materials as analyzed by the Hydrologic Laboratory of the U.S. Geological Survey, U.S. Geol. Surv. Water-Supply Paper 1839-D, 42p.*

- Bouwer and Rice (1976);
- Hvorslev (1957);
- Hyder et al. (KGS) (1994);
- Dagan (1978); and
- Springer-Gelhar (1991).

According to Aqtesolv®, the basic assumptions used for all of these methods include:

- Aquifer has infinite areal extent;
- Aquifer is homogeneous and of uniform thickness;
- Test well is fully or partially penetrating;
- Aquifer is unconfined (except Hvorslev);
- Flow to well is quasi-steady-state (storage is negligible);
- Volume of slug, V, is injected into or discharged from the well instantaneously;
- Flow is unsteady (KGS method only); and
- Water is released instantaneously from storage with decline of hydraulic head (KGS method only).

Although the Hvorslev (1951) method assumes the aquifer is confined, Aqtesolv® provides an unconfined aquifer variant of the solution which applies a filter pack porosity correction for wells screened across the water table. For each method, the Aqtesolv® definitions and assumptions are provided in Attachment 4.

Aqtesolv® v-4.50.002 Professional was used for the solution calculations and curve fitting. All graphical solutions are provided as Attachment 5. The results of all the slug test methods are provided as Table 4. Arithmetic means of each solution method are provided for each well. The geometric means (using the arithmetic means from each well) are provided for each method used. In addition, the geometric means for Bouwer and Rice (1976) method only are provided independently for the Burn Site wells, and independently for the Rail Road Site wells (Table 4).

Because the Bouwer and Rice (1976) method is generally accepted given the site conditions (i.e., unconfined aquifer with partially penetrating wells), these data were used as a benchmark for the comparison of other slug test solution methods. The Bouwer and Rice (1976) results indicate an estimated hydraulic conductivity range of approximately 0.4 – 27.8 ft/day for the shallow groundwater.

The Hvorslev (1951) and Dagan (1978) methods yielded results greater than or equal to the results calculated using the Bouwer and Rice (1976) estimates. The unconfined variant of Hvorslev (1951) estimated a range of approximately 0.6 – 46.9 ft/day. The Dagan (1978) estimated range is approximately 0.5 – 33.0 ft/day.

The KGS (1994) and Springer-Gelhar (1991) methods yielded consistently lower results than the Bouwer and Rice (1976) estimates. The combined estimated range of the KGS (1994) and the Springer-Gelhar (1991) methods is 0.5 – 2.8 ft/day.

A linear correlation plot of the slug test data is provided (Attachment 5, Figure 1) and for each well an assessment of the precision of each method was made based on the relative standard deviation (Attachment 5, Table 1). The median was used for this evaluation because it is less affected by outlier data than the mean. A high precision rating was not calculated for any of methods used at any of the wells. A moderate precision was calculated using Bower and Rice (1976) at BSMW0001. A low or very low precision rating was calculated for the remaining test methods and wells, though Bouwer and Rice (1976) generally exhibited a similar or relatively higher level of precision compared to the other methods.

7.3.2 Recommendations for Hydraulic Conductivity

Sherwin-Williams has evaluated various slug test methodologies and based upon that evaluation recommends that the Bouwer and Rice (1976) method be used for any future site-specific calculations (e.g., seepage velocity) which require an estimated hydraulic conductivity parameter. Depending on the use of the calculation, either well-specific arithmetic mean values or site-specific geometric mean values may be applied. As previously discussed, these values are summarized in Table 4. The Bouwer and Rice (1976) solution is selected because: 1) this most commonly used method is generally accepted by EPA for unconfined aquifers; 2) the differences between all solutions evaluated were less than an order of magnitude; and 3) the Bouwer and Rice (1976) results have a relatively higher level of precision as compared to slug tests results obtained using other methods.

The summary of results of the hydraulic conductivity testing in the Burn Site/Rail Road Site is provided in Table 4. For only Burn Site wells, the combined geometric mean for the Bouwer and Rice (1976) method was approximately 2.8 ft/day and for only Rail Road Site wells the combined geometric mean was approximately 1.0 ft/day.

7.4 Site-Specific Groundwater Seepage Velocity

In order to calculate the range of seepage velocities, the hydraulic conductivity values derived from the Bouwer and Rice (1976) method discussed above were used. The data from the September 12, 2006, gauging event were chosen as representative of site conditions and were subsequently used in the seepage velocity calculations. The seepage velocity is calculated by:

$$v = \frac{K(dh)}{n(dl)}$$

where,

v = seepage velocity
K = hydraulic conductivity
dh/dl = horizontal hydraulic gradient
n = porosity = 0.3 (assumed)

A seepage velocity was calculated for the horizontal hydraulic gradient regimes discussed in the previous section using the respective hydraulic conductivity calculated by the Bouwer and Rice (1976) method for each well. A separate calculation was also performed using the site geometric mean calculated using Bouwer and Rice (1976).

- Northern Burn Site Area (White Sand Branch) – The calculated seepage velocities for this area of the site range from 0.044 to 0.092 ft/day when using the arithmetic mean of the hydraulic conductivity values for slug tests at BSMW0001 and BSMW0004. When the Burn Site geometric mean K value (2.763 ft/day) was used, the seepage velocity was calculated as 0.155 ft/day.

- When calculating the seepage velocity from BS-05 to BS-04 (along the axis of White Sand Branch) using the arithmetic mean of the hydraulic conductivity values for slug tests at BSMW0003 and BSMW0004, the seepage velocity ranged from 0.007 to 0.017 ft/day. When the site geometric mean K value (2.186 ft/day) was used, the seepage velocity was calculated as 0.05 ft/day. When the Burn Site geometric mean K value (2.763 ft/day) was used, the seepage velocity was calculated as 0.029 ft/day.

- Western Burn Site Area (United States Avenue) – The seepage velocities for this area of the site ranged from 0.087 to 0.752 ft/day when using the arithmetic mean of the hydraulic conductivity values for slug tests at BSMW0005 and BSMW0006. When the Burn Site geometric mean K value (2.763 ft/day) was used, the seepage velocity was calculated as 0.075 ft/day.

- Southern Burn Site Area (Honey Run) - The seepage velocities for this area of the site ranged from 0.187 to 0.194 ft/day when using the arithmetic mean of the hydraulic conductivity values for slug tests at MW-9 and MW-10. When the Burn Site geometric mean K value (2.763 ft/day) was used, the seepage velocity was calculated as 0.161 ft/day.

- When calculating the seepage velocity from BS-03 to BS-04 (along the axis of Honey Run) using the arithmetic mean of the hydraulic conductivity values for slug tests at BSMW0007 and BSMW0004, the seepage velocity ranged from 0.027 to 0.054 ft/day. When the Burn Site geometric mean K value (2.763 ft/day) was used, the seepage velocity was calculated as 0.045 ft/day.

A summary of the seepage velocity calculations using the hydraulic conductivity derived from the Bouwer and Rice (1976) solutions is presented in Table 5. A conceptual figure illustrating groundwater flow pathways is presented as Table 5 – Figure 1.

7.5 Shallow Groundwater Sampling, September and October 2005

The shallow Burn Site/Rail Road Site wells, including the four shallow existing Burn Site wells (MW-7, MW-8, MW-9 and MW-10) were sampled approximately one month apart during two separate events in August and September/October 2005. The deeper well (MW-40) had been sampled previously in 2003, but was not sampled as part of this monitoring event.

During the sampling events, all monitoring wells were purged and sampled using a micro-purge bladder pump equipped with new, dedicated Teflon®-lined discharge tubing. All sampling equipment was decontaminated prior to initial use, between each sampling location, and after completion of the groundwater sampling event. STL conducted the sampling events and collected all field parameters under supervision of Weston. STL is a New Jersey Department of Environmental Protection (NJDEP) certified laboratory (certification number 12028).

The wells were purged and sampled following the EPA low-flow groundwater sampling protocols and consistent with NJDEP protocols. The pump intake was set at the mid-screen depth and while the monitoring wells were being purged, the water quality parameters of temperature, pH, Eh, dissolved oxygen and specific conductivity were monitored using the Hach Sensor 1 multi-parameter water quality meter every three to five minutes until stabilization was achieved. Another parameter, turbidity, was monitored separately during purging using a LaMotte Model 2020 turbidity meter. Depth to water was monitored using a Solinst® electronic water level meter. A Solinst® interface probe was also used for groundwater-level monitoring to check for the presence of non-aqueous phase liquids (NAPLs) in groundwater. All purging parameter observations were recorded noting the presence of discernible odors and visible sheens. A PID (MultiRAE Plus) was used to measure the presence of volatile organic compounds (VOCs) in the well casings prior to any well monitoring.

Following collection in the field, groundwater samples were immediately transferred to a cooler with ice. A chain-of-custody was created at the end of each sampling event and delivered with the samples to STL in Edison, NJ. The analytical requirements for groundwater samples included Contract Laboratory Program (CLP) analyses (VOC+15, BNA+25, PCB, PCP, metals, cyanide) and several monitoring of natural attenuation (MNA) parameters (CO_2, total organic carbon, total dissolved solids [TDS], total suspended solids [TSS], Fe^{2+}, sulfide, sulfate, nitrate, nitrite, alkalinity, methane, ethane, ethene and chloride). A 4-week turnaround time was requested for the analyses.

In addition to investigative samples, quality assurance/quality control (QA/QC) samples were collected in accordance with Weston's Quality Assurance Project Plan (QAPP). Blind field duplicate and matrix spike/matrix spike duplicate (MS/MSD) samples were collected at a rate of one per 20 samples per analytical parameter. Field blanks were collected minimally once per event and analyzed for the same parameters as the field samples. Trip blanks (laboratory deionized water) were analyzed for VOCs once per shipment.

7.6 Summary of Groundwater Sampling Results

The groundwater sampling analytical results were previously submitted under separate cover in the document entitled "*Evaluation of Strategic Sampling Results, U.S. Avenue Burn Site and Associated Reaches of Honey Run and White Sands Branch*" (June 19, 2006). Figure 5, "Burn Site Groundwater Samples Round 1 (August 2005) and Round 2 (September/October 2005) Exceedences (all parameters)" is excerpted from the June 19, 2006 report and provided as Attachment 6[2].

As discussed in the June 19, 2006 report and summarized in Attachment 6, the groundwater sampling at the Burn Site and Rail Road Site found several constituents at concentrations greater than the New Jersey Department of Environmental Protection Class II-A Ground Water Quality Standards (GWQS), the criteria against which the groundwater sampling results were screened. These were:

- Benzene was found in four wells, two located in the northern portion of the Site (BSMW0002 and BSMW0003), and two in the center of the Site (MW-7 and MW-9). The highest concentrations (19 ug/L – 42 ug/L) were found in MW-9.
- Pentachlorophenol (PCP) was found in monitoring well, MW-7 at concentrations of 3.8 and 4.0 ug/L in August 2005 and 0.9 ug/l in October 2005, as compared to its screening criterion of 0.3 ug/l.
- Select metals were found in all wells at concentrations greater than their GWQS. As presented in the June 2006 report:
  - Arsenic was found at its highest concentrations (1,340 ug/L and 1,490 ug/L) in existing monitoring well MW-7, located in the center of the site, south of Honey Run. Arsenic was also found in monitoring wells BSMW0002, BSMW0003 and BSMW0004, located in the Northern Burn Site Area at concentrations ranging from 4.9 ug/L to 15.3 ug/L, and monitoring wells MW-8 and MW-9, located in the Southern Burn Site Area, at concentrations ranging from 5.9 to 9.6 ug/L. Arsenic was found at concentrations ranging from 4.7 ug/L to 8 ug/L in the two monitoring wells installed on the Rail Road Site.
  - The highest concentrations of lead were found in monitoring wells BSMW0002 (210 ug/L and 153 ug/L), MW-7 (98.9 ug/L – 100 ug/L), MW-9 (17.1 ug/L - 76.4 ug/L), BSMW0003 (27 ug/L – 46.6 ug/L), BSMW0005 (19.5 ug/L – 20.1 ug/L), and MW-8 (9.2 ug/L). Lead was not found at a concentration greater that its GWQS in either well installed on the Rail Road Site.

[2] *Figures 1, 5, and 6 of the Jun 19, 2006 document have the well locations BSMW0005 and BSMW0007 and associated data inadvertently transposed. BSMW0005 is actually located along the fence line adjacent to United States Avenue; and BSMW0007 is actually located south of Honey Run at the southeast boundary of the Burn site. A corrected Figure 5 (dated 08/14/09) showing the revised well locations and associated data is included with this submission.*

- The presence of several other metals, including aluminum, iron, manganese and sodium appear to be naturally occurring. This conclusion was based on an evaluation of the results of the soil investigation and the distribution of these constituents in groundwater. With the exception of iron, these constituents were not found in soil at concentrations greater than the New Jersey Residential Direct Contact Soil Cleanup Criteria (RDCSCC), the criteria against which the soil samples were screened, and they were all found at multiple locations in groundwater across the site.

There is some question as to whether the reported concentrations of metals are representative of non-particulate (i.e. not adsorbed) concentrations in the wells. As discussed further in this memorandum, measures will be implemented to attempt to minimize the effects of turbidity on the sampling results.

8.0 GROUNDWATER INVESTIGATION SCOPE OF WORK

Based on the results of the initial groundwater sampling conducted in 2005 and the more recent hydraulic evaluation, Sherwin-Williams has identified four objectives for this phase of groundwater investigation:

1. Obtain an understanding of the vertical distribution of constituents in the unconfined aquifer.

2. Horizontally define the extent of non-particulate constituents previously found in the shallow monitoring wells.

3. Refine the current understanding of the vertical hydraulic gradient between the deeper confined aquifer and the unconfined aquifer.

4. Ensure that the data collected are, to the extent practicable, reflective of non-particulate conditions, minimizing the effects of turbidity in the samples.

To achieve these objectives, Sherwin-Williams is proposing:

- Installation of seven additional groundwater wells within the unconfined aquifer. Six of the new wells will be installed at the Burn Site; and one well is proposed at the Rail Road Site. The seven proposed wells are comprised of one couplet (one shallow and one intermediate well) and 5 intermediate wells.

- Redevelopment of the four wells installed in 1981 (MW-7, MW-8, MW-9, MW-10), redevelopment of the deep well MW-40, and development of all newly proposed wells.

- Collection of two additional rounds of groundwater and surface water samples along with a synoptic round of water levels (groundwater and surface water) prior to sampling. Upon evaluation of the first round laboratory analytical results, a technical memorandum will be submitted discussing the results and proposing any modifications to the analytical parameters for the next round.

Each of the tasks is discussed below.

9.0 MONITORING WELL INSTALLATION

The seven proposed wells will be installed in the following locations:

9.1 Shallow Well

As discussed in the June 19, 2006 report, the horizontal extent of constituents in groundwater is well defined by the existing monitoring well network. The perimeter wells on the Southern and Western Burn Site Areas contained only metals that are most likely attributable to natural conditions (aluminum, iron, manganese, thallium). Similarly, BSMW0001, located upgradient of BSMW0002, BSMW0003 and BSMW0004 on the Northern Burn Site Area, also contained constituents that are most likely associated with background conditions, although it is noted that the pesticide beta-BHC was found at an estimated concentration greater than its NJDEP GWQS of 0.04 ug/L in the October 2005 sampling round. Finally, the arsenic concentrations in both monitoring wells RRMW0001 (4.7 ug/L to 6.8 ug/l) and RRMW0002 (6.4 ug/L to 8 ug/l) approached the NJDEP GWQS of 3 ug/L.

No additional shallow monitoring wells are proposed to delineate site constituents, with the exception of the shallow well proposed at MW-40 as discussed below.

9.2 Couplet at MW-40

Two additional wells, the proposed couplet, will be installed at MW-40. This is the location at which shallow groundwater discharges to White Sand Branch on the west side of the Burn Site Area, and collecting additional groundwater data at this location will provide an understanding of groundwater chemistry at the most down gradient location of the western Burn Site Area. Installing wells in the unconfined aquifer in this location will also supplement the current understanding of the vertical hydraulic gradient between the deeper confined aquifer and the shallow unconfined aquifer.

9.3 Intermediate Wells

Intermediate groundwater wells will be installed at current locations BSMW0002, BSMW0004, MW-7, MW-9, and RRMW0001 to assess the vertical distribution of constituents found in shallow groundwater in these locations. Specifically:

- The intermediate well at location BSMW0002 will be used to evaluate the vertical distribution of the metals and benzene found in BSMW0002. BSMW0002 is the location at which the highest concentration of lead was found in groundwater.

- The intermediate well at location BSMW0004 will be used to evaluate the vertical distribution of metals found in BSMW0004, and will also serve as a down gradient location to monitor intermediate groundwater conditions in the northern Burn Site Area.

- The intermediate well at location MW-7 will be used to assess the vertical distribution of pentachlorophenol, arsenic, and lead found in MW-7. MW-7 was the location at which the highest concentration of arsenic was found and was the only location at which pentachlorophenol was found at a concentration greater than the GWQS.

- The intermediate well at location MW-9 will be used to evaluate the vertical distribution of the benzene and metals found in MW-9. MW-9 is the location in which the highest concentrations of benzene were found.

- The intermediate well at location RRMW0001 will be used to evaluate the vertical distribution of elevated arsenic concentrations found in RRMW001 and RRMW0002. In addition, this proposed well will assess intermediate depth water quality west of the Burn Site, and adjacent to Bridgewood Lake.

A summary of the rationale and depths for each proposed monitoring well is provided in Table 6. The proposed monitoring well locations are presented on the attached Figure 5.

9.4 Well Installation Details

All proposed monitoring wells will be screened within the unconfined aquifer.

Based on the depth of the top of the confining unit at MW-40 (44 feet bgs), the shallow well will be screened 5 to 15 feet bgs, and the intermediate well will be screened 25 to 35 feet bgs.

All proposed intermediate monitoring wells will have a 10-foot screen length. The proposed intermediate wells will be installed so the top of the well screen is a minimum of 10 feet below the bottom of the existing well screen. The intermediate wells at BSMW0002, BSMW0004, MW-7, MW-40, and RRMW0001 will be screened 25 to 35 feet. The intermediate well at MW-9 will be screened 30 to 40 feet bgs. It is not anticipated that the intermediate wells will need to be double-cased, though this option will be dependent upon the observed geology and site conditions.

The monitoring wells will be installed using a Geoprobe® rig capable of hollow-stem auger (HSA) borings. Prior to the well installation, continuous split spoons or MacroCore® acetate sleeves will be collected and all cores will be field-screened at 2-foot intervals with a PID and x-ray fluorescence (XRF) unit. The geology will be logged by a qualified field geologist and visual observations such as staining will be noted. For each newly installed well, a soil sample will be collected from the midpoint of the screened interval or from the soils exhibiting the highest PID or XRF readings from within the proposed 10-foot screened interval, and submitted to the laboratory for CLP analyses for Target Compound List (TCL) Volatile Organic Compounds (VOCs), TCL Semivolatile Organic Compounds (SVOCs); Target Analyte List (TAL) Metals plus cyanide and Total Organic Carbon (TOC).

In the location where a shallow and intermediate well couplet is to be installed, continuous logging will only be performed for the deeper boring to its target depth (35 feet bgs) and the shallow well will be installed via blind drilling to its target depth (15 feet bgs). A soil sample will be collected from both the shallow and deep well boreholes. These samples will be collected from the midpoint of the screened interval or from the soils exhibiting the highest PID or XRF readings from within the proposed 10-foot screened interval. Soil samples for laboratory analysis will be collected as described above for both the shallow and deep well boring.

In cases where an intermediate well is to be installed adjacent to an existing shallow well to form a couplet, then the intermediate well will be logged continuously starting at the ground surface. A soil sample will be collected from the midpoint of the screened interval or from the soils exhibiting the highest PID or XRF readings from within the proposed 10-foot screened interval, and submitted for laboratory analysis as described above.

Monitoring wells will be installed by over-drilling each soil boring location using 8-inch outside diameter (4.25-inch inside diameter) hollow-stem augers. The monitoring wells will be constructed using 2-inch-diameter, schedule-40 polyvinyl chloride (PVC) well screens and riser pipes. The well screens will be 10 feet in length with 0.010-inch (10 slot) slot sizes. The well filter pack will be constructed with Morie sand #1 and granulated bentonite will be used to fill the annular seal above the sand filter pack. The filter packs will be placed in the well borehole from approximately 1 foot below or at the bottom of the well screens up to approximately 1 to 2 feet above the screen. A finer Morie sand #00 will be used as a choke layer between the filter pack and the bentonite seal. The wells will be finished above grade using 6-inch diameter protective steel stick-up outer casings or as flush mount installations depending upon the location. Sloping concrete pads measuring approximately 2 feet by 2 feet and 4 inches to 6 inches thick will be placed around the protective outer casings to seal and secure the wells above ground. All wells will be marked with their respective identifications on steel tags held by steel collars around the well outer casings.

9.5 Monitoring Well Development

All newly-installed monitoring wells, as well as MW-7, MW-8, MW-9, MW-10, and MW-40, will be developed prior to the sampling event and as per NJDEP requirements, a New Jersey-licensed well driller will be used to develop the wells. All wells will be developed as per the Standard Guide for Development of Ground-Water Monitoring Wells in Granular Aquifers (ASTM, 2005).

The monitoring wells will be developed in a similar matter as the monitoring wells installed during the summer, 2005. The monitoring wells will be developed following installation by using a surge block and small submersible pumps (Whale and/or Typhoon pumps). The pump initially will be placed at the bottom of the well screen and manually surged up and down at periodic intervals. A portable turbidity meter (LaMotte Model 2020) will be used to monitor water turbidity during well development. The turbidity meter will be calibrated in the field prior to well development using turbidity standards of 1 and 1,000 nephelometric turbidity units (NTU). Water will be collected directly from the dedicated polyethylene pump discharge tubing at 5-minute intervals for turbidity monitoring and the development water will be discharged to the ground adjacent to the monitoring well.

The monitoring wells will be developed until the development water becomes silt-free and relatively clear based on the following protocol. If turbidity levels have improved to acceptable levels after two hours, the development will be considered complete. If turbidity levels have not improved, the development will continue for up to another two hours (for a total of four hours). If, after the four hour period, an improvement in turbidity is not observed, the well will be allowed to equilibrate overnight and the development will be performed again. If no improvement in turbidity levels is observed after the second attempt, the development effort will be terminated and the well will be allowed to rest for 2 weeks prior to being sampled.

In accordance with the NJDEP Field Sampling Procedures Manual, the development water generated in the field will be discharged to the ground adjacent to the monitoring well. Discharge of the development water to the ground surface where the groundwater is considered to be contaminated is permissible by the NJDEP August 2005 "*Field Sampling Procedures Manual*" provided the following conditions are met: 1) the water is not permitted to migrate off-site; 2) there is no potential for contaminating a previously uncontaminated aquifer; and 3) the discharge will not cause an increase to ground surface soil contamination. As provided in the June 2007 "*NJPDES Discharges to Ground Water Technical Manual for the Site Remediation Program*", discharges to groundwater at remediation sites associated with the installation, development, and sampling of monitoring wells do not require a written pre-approval from the NJDEP or public notification.

9.6 Monitoring Well Sampling

Two rounds of sampling will be conducted for all newly installed and existing wells at the Burn Site/Rail Road Site. A synoptic round of water levels will be collected at all the wells prior to each sampling event. The monitoring wells will be sampled utilizing the same procedures as described for the sampling event conducted during summer 2005. The wells will be purged and sampled following the EPA low-flow groundwater sampling protocols and consistent with NJDEP protocols. Upon evaluation of the first round laboratory analytical results, a technical memorandum will be submitted discussing the results and proposing any modifications to the analytical parameters for the next round.

While the monitoring wells are being purged, water quality indicator parameters including temperature, pH, Eh, dissolved oxygen and specific conductivity will be monitored using a multi-parameter water quality meter and flow-through cell. Readings will be collected every five minutes until stabilization has been achieved. Another parameter, turbidity, will be monitored separately during purging using a LaMotte Model 2020 turbidity meter. Depth to water will be monitored using a Solinst® electronic water level meter. A Solinst® interface probe also will be used to measure drawdown and to check for the presence of NAPLs in groundwater. All purging parameter observations will be recorded noting the presence of discernible odors and visible sheens. A PID (MultiRAE Plus) will be used to screen for the presence of VOCs in the well casings prior to any well gauging or sampling.

Groundwater samples will be analyzed for specific constituents known to exceed their respective criteria. These analyses are TCL VOCs, TCL SVOCs, TAL metals plus cyanide, TCL pesticides, chloride, TOC, TDS, and TSS.

The proposed analyses and their analytical method are presented in Table 7.

In addition to investigative samples, QA/QC samples will be collected in accordance with the QAPP. Blind field duplicate and MS/MSD samples will be collected at a rate of one per 20 samples per analytical parameter. Field blanks will be collected minimally once per event and analyzed for the same parameters as the field samples. Trip blanks (laboratory deionized water) will be analyzed for VOCs once per shipment.

In accordance with the NJDEP Field Sampling Procedures Manual, as discussed in Section 9.5 – Monitoring Well Development, the purge water generated in the field will be discharged to the ground adjacent to the monitoring well.

9.7 Surface Water Sampling

In order to assess the surface water pathway, Sherwin-Williams will also collect surface water samples at the confluence of White Sand Branch and Honey Run before they exit the Burn Site (above the railroad tracks) and at the outflow into Bridgewood Lake on the other side of the railroad tracks.

Sherwin-Williams had previously collected unfiltered surface water samples at the above-referenced locations at the Burn Site and Bridgewood Lake during the 2005 investigation activities. Sample WSDW0001 was collected at the confluence of White Sand Branch and Honey Run before they exit the Burn Site (above the railroad tracks), and BWDW0010 was collected at the outflow into Bridgewood Lake on the other side of the railroad tracks.

These samples will be collected concurrent with each monitoring well sampling round.

Surface water samples will be collected from the bottom of the water column, 0.5 feet above the surface water/sediment interface. It is noted that, based on previous sampling events at the Burn Site, the surface sediment is very fine-grained and easily disturbed. Therefore, there is a high potential for sampling activities near the surface water/sediment interface to create turbidity that would bias the result of the surface water analysis. This will to some extent be mitigated with the collection of both filtered and unfiltered surface water samples, as filtering will remove sediment particles from the sample.

The collection method for the surface water samples will be dependent upon the depth to water and the accessibility of the sampling location. Deeper samples may be collected using Teflon tubing connected to a peristaltic pump. Shallow samples will be collected as grab samples, using the sample container or a clean sample collection device. More detailed information regarding the surface water collection methods is included in the Quality Assurance Project Plan (QAPP) provided in Appendix B in the "*Supplemental Remedial Investigation Work Plan – Sherwin-Williams/Hilliard Creek Site – Former Manufacturing Plant – Gibbsboro, NJ*" revised July 2009.

Both filtered and unfiltered samples will be collected at WSDW0001 and BWDD0010. Filtering will be performed in the field, using a dedicated in-line 0.45-micron pore-diameter cartridge filter. Certified-clean filter assemblies will be used for each sample collected for dissolved metals analysis. The QAPP in the above-referenced Appendix B provides additional detail regarding the sample collection and filtering methods.

The surface water samples will be analyzed for TCL VOCs, TCL SVOCs, TAL Metals plus cyanide, TCL Pesticides, TOC, TDS, TSS, hardness (as $CaCO_3$) and pH.

The proposed analyses and their analytical method are presented in Table 7.

Upon evaluation of the first round laboratory analytical results, a technical memorandum will be submitted discussing the results and proposing any modifications to the analytical parameters for the next round.

Attachment 1:
Soil Boring and Monitoring Well Construction Logs
(included on CD)

Contents

Notes:

No monitoring well construction logs are available for MW-7, MW-8, MW-9 and MW-10.

Each "Log of Borehole" includes a soil boring log and monitoring well construction diagram.

Attachment 2: Monitoring Well Permits, Monitoring Well Records, and Monitoring Well Certification-Form A- As-Built Certifications (included on CD)

Contents

NJDEP Monitoring Well Permits*, approved June 10, 2005 (1 page)
NJDEP Monitoring Well Permits**, approved June 27, 2005 (1 page)
"Test Boring Location Plot Plan, Dated June 6, 1981, Annotated by R. Costa 10/12/06 (1 page)

Well ID	**Monitoring Well Record**	**Monitoring Well Form A**	**Total No. pages**
MW-7 (Formerly MW-12)	•	NA	1
MW-8 (Formerly MW-13)	•	NA	1
MW-9 (Formerly MW-11)	•	NA	1
MW-10	•	NA	1
MW-40	•	NA	1
BSMW0001	•	•	2
BSMW0002	•	•	2
BSMW0003	•	•	2
BSMW0004	•	•	2
BSMW0005	•	•	2
BSMW0006	•	•	2
BSMW0007	•	•	2
RRMW0001	•	•	2
RRMW0002	•	•	2

Notes:

X = Included in this Attachment
NA = Not Available
No NJDEP Well Permits were available for MW-7, MW-8, MW-9, MW-10, and MW-40.

* Monitoring Well Permit nos. for "BWMW001", "BWMW002", and "BSMW001" through "BSMW004" are issued on single NJDEP Monitoring Well Permit form DWR-133M.

** Monitoring Well Permit nos. for "BSMW005", "BSMW006", and "BSMW007" are issued on single NJDEP Monitoring Well Permit form DWR-133M.

The drillers used a 3-numeral suffix for the well IDs, whereas Weston used a 4-numeral suffix. Therefore, as an example, "BSM001" referenced by the driller is the same monitoring well as "BSMW0001" referenced by Weston.

The "BWMW" prefix used by the driller is equivalent to the "RRMW" prefix used by Weston. Therefore, as an example, "BWMW001" referenced by the driller is the same monitoring well as "RRMW0001" referenced by Weston.

Attachment 3:
Monitoring Well Certification-Form B- Location Certifications
(included on CD)

Contents

Well ID	Form B (dated 5/23/06)	Total No. pages
MW-7	NA	0
MW-8	NA	0
MW-9	NA	0
MW-10	NA	0
MW-40	NA	0
BSMW0001*	•	1
BSMW0002*	•	1
BSMW0003*	•	1
BSMW0004*	•	1
BSMW0005*	•	1
BSMW0006*	•	1
BSMW0007*	•	1
RRMW0001*	•	1
RRMW0002*	•	1

Notes:

• = Form B included in this attachment

NA = Not Available

* The surveyor used a hyphen between the letters and numbers of the alpha-numeric owner's well ID number; whereas no hyphen was used be Weston. Therefore, as an example, "BSMW-0001" referenced by the surveyor is the same monitoring well as "BSMW0001" referenced by Weston.

Attachment 4: AQTESOLV's Definitions and Assumptions for "Solutions for Slug Tests in an Unconfined Aquifer" (included on CD)

Contents

Method	AQTESOLV's Definitions and Assumptions	Total No. pages
Bouwer-Rice (1976)	•	3
Dagan (1978)	•	3
Hvorslev (1951)	•	2
Hyder et al. (1994)	•	4
Springer-Gelhar (1991)	•	4

Note: • = Definitions and assumptions included in this attachment

Attachment 5: Hydraulic Conductivity Tests Graphical Solutions and Statistical Evaluation (included on CD)

Contents

Well ID	Test Type	Trial	Bouwer-Rice (1976)	Hvorslev (1957)	Hyder et al. (KGS) (1994)	Dagan (1978)	Springer-Gelhar (1991)	Total No. pages
BSMW001	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
BSMW002	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
BSMW003	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
BSMW004	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
BSMW005	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5

Well ID	Test Type	Trial	Bouwer-Rice (1976)	Hvorslev (1957)	Hyder et al. (KGS) (1994)	Dagan (1978)	Springer-Gelhar (1991)	Total No. pages
BSMW006	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
BSMW007	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
RRMW0001	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
RRMW0002	Falling Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5
	Rising Head	1	•	•	•	•	•	5
		2	•	•	•	•	•	5

Notes:
• = graphical solution included in this attachment
No slug tests were conducted at MW-7, MW-8, MW-9, and MW-10.

Attachment 6:

"Figure 5 - Burn Site - Groundwater Samples - Round 1 (August 2005) and Round 2 (September/October 2005) - Exceedances (All Parameters)"

This figure is excerpted from the June 19, 2006 report entitled "*Evaluation of Strategic Sampling Results, U.S. Avenue Burn Site and Associated Reaches of Honey Run and White Sands Branch*".

TABLE 3

GROUNDWATER AND SURFACE WATER ELEVATION DATA
SHERWIN-WILLIAMS
BURN SITE and RAIL ROAD SITE
Gibbsboro - NJ

		Date:	10/11/2005		11/23/2005		1/5/2006		1/31/2006		2/20/2006		3/23/2006		9/12/2006	
LOCATION	Reference	Reference Elevation (ft-amsl)	TIC DTW (ft)	Elevation (ft)	DTW (ft)	Elevation (ft)	DTW (ft)	Elevation (ft)	DTW (ft)	Elevation (ft)	DTW (ft)	Elevation (ft)	DTW (ft)	Elevation (ft)	DTW (ft)	Elevation (ft)
Shallow Monitoring Wells																
BSMW0001	TIC	83.25	9.18***	74.07***	6.02	77.23	5.54	77.71	5.10	78.15	5.24	78.01	5.66	77.59	5.86	77.39
BSMW0002	TIC	82.05	6.22	75.83	6.30	75.75	5.96	76.09	6.06	75.99	6.10	75.95	6.31	75.74	6.26	75.79
BSMW0003	TIC	79.39	3.33	76.06	3.43	75.96	3.30	76.09	3.28	76.11	3.35	76.04	4.58	74.81	3.40	75.99
BSMW0004	TIC	82.22	6.80	75.42	6.89	75.33	5.61	76.61	6.58	75.64	6.60	75.62	4.62	77.60	6.78	75.44
BSMW0005	TIC	83.67	6.63	77.04	6.27	77.40	5.11	78.56	5.32	78.35	5.34	78.33	5.68	77.99	5.61	78.06
BSMW0006	TIC	86.22	4.10	82.12	4.16	82.06	3.35	82.87	3.25	82.97	3.22	83.00	3.98	82.24	3.80	82.42
BSMW0007	TIC	84.08	4.77	79.31	4.53	79.55	4.38	79.70	4.39	79.69	4.40	79.68	4.68	79.40	4.66	79.42
RRMW0001	TIC	79.71	4.70	75.01	4.30	75.41	4.00	75.71	3.98	75.73	4.03	75.68	4.35	75.36	4.21	75.50
RRMW0002	TIC	79.54	4.30	75.24	4.41	75.13	4.05	75.49	4.15	75.39	4.20	75.34	4.42	75.12	4.36	75.18
MW-7	TIC	82.81	4.21	78.60	3.95	78.86	3.09	79.72	3.45	79.36	5.21	77.60	4.00	78.81	3.78	79.03
MW-8	TIC	85.73	4.41	81.32	4.70	81.03	3.32	82.41	3.85	81.88	3.90	81.83	4.75	80.98	4.38	81.35
MW-9	TIC	88.83	8.05	80.78	7.70	81.13	6.88	81.95	7.19	81.64	7.25	81.58	7.76	81.07	7.55	81.28
MW-10	TIC	89.65	5.15	84.50	4.85	84.80	3.80	85.85	4.13	85.52	4.18	85.47	4.83	84.82	4.71	84.94
Surface Water - ft-amsl																
BS-01*	CM-10	82.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.84
BS-02*	CM-10	82.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	79.02
BS-03*	CM-10	82.61	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.94
BS-04**	MW-40(TIC)	83.21	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.42
BS-05**	CM-09A	78.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75.97
RR-01	RRMW0001(TOC)	80.44	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	74.28
Deep Monitoring Well																
MW-40	TIC	83.21	4.80	78.41	4.35	78.86	4.16	79.05	3.50	79.71	3.51	79.70	4.00	79.21	NA	NA

NOTES:

TIC - Top of Inner Casing
TOC - Top of Outer Casing
DTW - Depth to Water
NA - No measurement
ft-amsl - feet above mean sea level
** - Honey Run
* - White Sand Branch
*** - DTW measurement is inconsistent with other tabulated events. Therefore, groundwater elevation data was not considered for contouring.

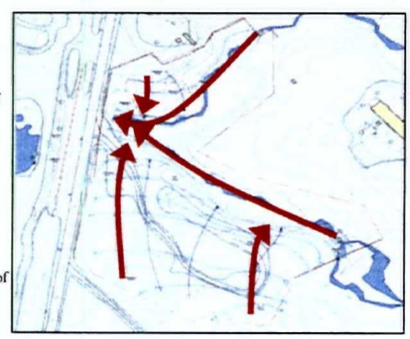
TABLE 5

SUMMARY OF GROUNDWATER SEEPAGE VELOCITIES
SHERWIN-WILLIAMS
BURN SITE
Gibbsboro - NJ

Bouwer and Rice Method					
Seepage Velocity Estimate	Parameter	Units	Area of Site (BS-05 to BS-04)		
			K = MW-0003	K = MW-0004	K = Burn Site Geometric Mean
	K	ft/day	0.723	1.638	2.763
Range	*dh/dl*	ft/ft	0.003	0.003	0.003
	v	**ft/day**	**0.007**	**0.017**	**0.029**
Seepage Velocity Estimate	Parameter	Units	Area of Site (MW-0001 to MW-0004)		
			K = MW-0001	K = MW-0004	K = Burn Site Geometric Mean
	K	ft/day	0.782	1.638	2.763
Range	*dh/dl*	ft/ft	0.017	0.017	0.017
	v	**ft/day**	**0.044**	**0.092**	**0.155**
Seepage Velocity Estimate	Parameter	Units	Area of Site (MW-0006 to MW-0005)		
			K = MW-0006	K = MW-0005	K = Burn Site Geometric Mean
	K	ft/day	3.213	27.840	2.763
Range	*dh/dl*	ft/ft	0.008	0.008	0.008
	v	**ft/day**	**0.087**	**0.752**	**0.075**
Seepage Velocity Estimate	Parameter	Units	Area of Site (MW-10 to MW-9)		
			K = MW-10 (MW-0006)	K = MW-9 (MW-0007)	K = Burn Site Geometric Mean
	K	ft/day	3.213	3.336	2.763
Range	*dh/dl*	ft/ft	0.017	0.017	0.017
	v	**ft/day**	**0.187**	**0.194**	**0.161**
Seepage Velocity Estimate	Parameter	Units	Area of Site (BS-03 to BS-04)		
			K = MW-0007	K = MW-0004	K = Burn Site Geometric Mean
	K	ft/day	3.336	1.638	2.763
Range	*dh/dl*	ft/ft	0.005	0.005	0.005
	v	**ft/day**	**0.054**	**0.027**	**0.045**

Notes:
v = seepage velocity
K = hydraulic conductivity
n = porosity = 0.3
dh/dl = horizontal hydraulic gradient

$$v = \frac{K(dh)}{n(dl)}$$



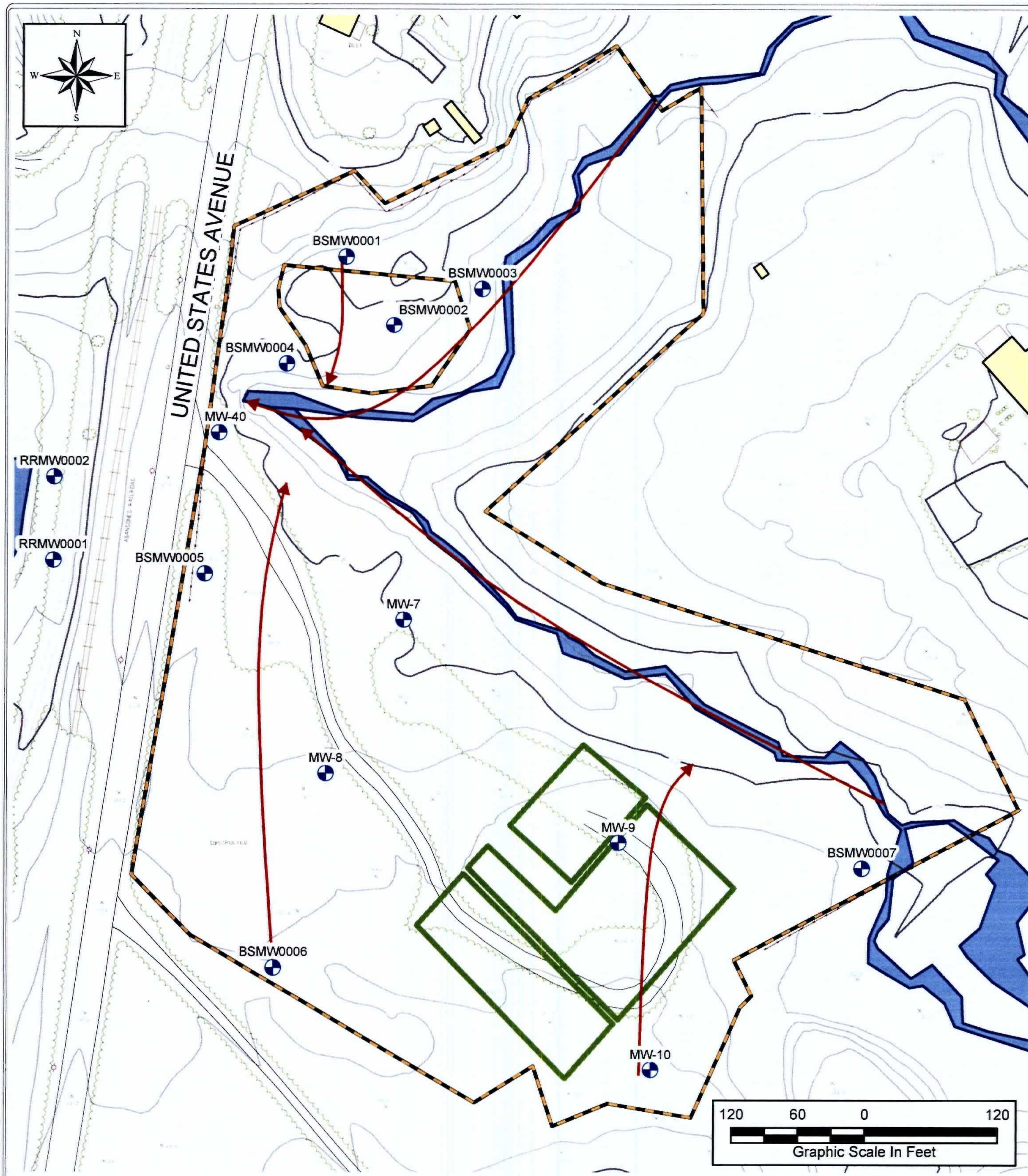
Northern Burn Site Area (White Sand Branch) - Horizontal hydraulic gradient and range of seepage velocities calculated using individual K values for BSMW0001, BSMW0004 and the site geometric mean calculated using the Bouwer & Rice method (Table 4).

Northern Burn Site Area (White Sand Branch) - BS-05 to BS-04 - Horizontal hydraulic gradient and range of seepage velocities calculated along axis of White Sand Branch using individual K values for BSMW0003, BSMW0004 and the site geometric mean calculated using the Bouwer & Rice method (Table 4).

Western Burn Site Area (United States Avenue) - Horizontal hydraulic gradient and range of seepage velocities calculated using individual K values for BSMW0005, BSMW0006 and the site geometric mean calculated using the Bouwer & Rice method (Table 4).

Southern Burn Site Area (Honey Run) - Horizontal hydraulic gradient and range of seepage velocities calculated using individual K values for BSMW0006, BSMW0007 and the site geometric mean calculated using the Bouwer & Rice method (Table 4).

Southern Burn Site Area (Honey Run) - BS-03 to BS-04 - Horizontal hydraulic gradient and range of seepage velocities calculated along axis of Honey Run using individual K values for BSMW0007, BSMW0004 and the site geometric mean calculated using the Bouwer & Rice method (Table 4).



LEGEND:

- Monitoring Well Location
- General Direction of Groundwater Flow
- Approximate Extent of Former Landfill Area

PROJECT: Sherwin-Williams Gibbsboro Remedial Investigation

CLIENT NAME: The Sherwin-Williams Company

TITLE:

Burn Site
Monitoring Well Location Map with
Conceptual Groundwater Flow Pathways

WESTON SOLUTIONS

DATE: 2/9/2010

FIGURE #: Table 5 - Figure 1

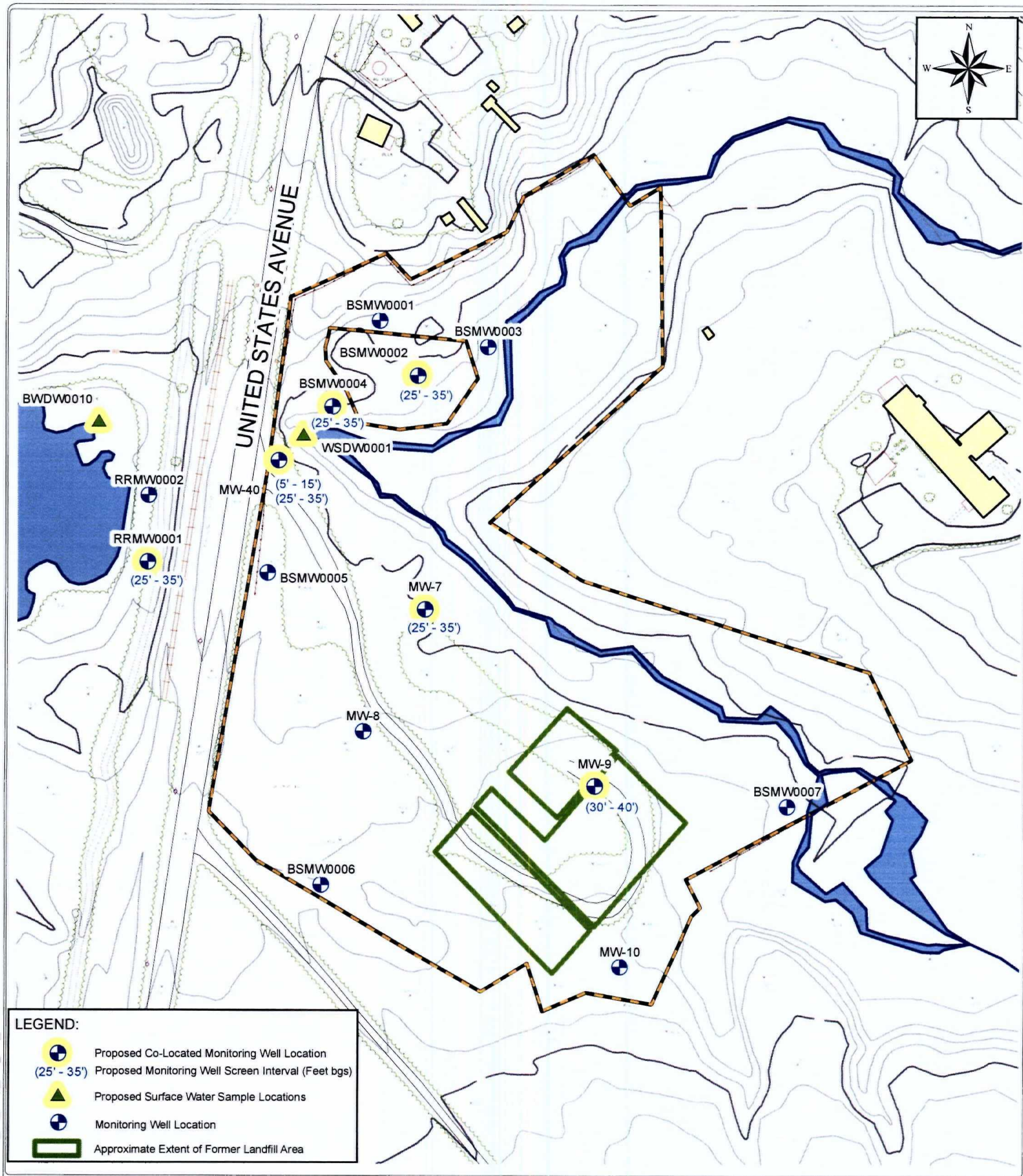
L:\SHERWIN\GIS\MXD\0110_Burnsite\07523_BW_MW.mxd

TABLE 7

PROPOSED ANALYTICAL METHODS
SHERWIN-WILLIAMS
BURN SITE and RAIL ROAD SITE
Gibbsboro - NJ

Analytical Parameters	Matrix	Preparation Method	Analysis Method
TAL metals	Soil	CLP SOW ILM05.4	CLP SOW ILM05.4
Cyanide	Soil	CLP SOW ILM05.4	CLP SOW ILM05.4
TCL VOC + 15	Soil	CLP SOW SOM01.2	CLP SOW SOM01.2
TCL SVOC + 25	Soil	CLP SOW SOM01.2	CLP SOW SOM01.2
TOC	Soil	None	Lloyd Kahn (Mod)
TAL metals	Groundwater (total and filtered)/ Surface water (total and filtered)	CLP SOW ILM05.4	CLP SOW ILM05.4
Cyanide	Groundwater (total and filtered)/ Surface water (total and filtered)	CLP SOW ILM05.4	CLP SOW ILM05.4
TCL VOC + 15	Groundwater / Surface water	CLP SOW SOM01.2 (trace)	CLP SOW SOM01.2 (trace)
TCL SVOC + 25	Groundwater / Surface water	CLP SOW SOM01.2	CLP SOW SOM01.2
TCL PCBs	Groundwater / Surface water	CLP SOW SOM01.2 (low)	CLP SOW SOM01.2 (low)
Pesticides	Groundwater / Surface water	CLP SOW SOM01.2 (low)	CLP SOW SOM01.2 (low)
TOC	Groundwater / Surface water	None	Standard Method (SM) 5310 B
TDS	Groundwater / Surface water	None	SM2540 B
TSS	Groundwater / Surface water	None	SM2540 D
Chloride	Groundwater	None	SM4500-Cl^- B
pH	Surface Water	SW-846 9040B	SW-846 9040B
Hardness	Surface Water	None	SM2340B or C

This information was obtained from the May 2009 Supplemental Remedial Investigation Work Plan Sherwin-Williams/Hilliards Creek Site, Appendix B - SAP / QAPP, Table 2-2



LEGEND:

150 75 0 150

Graphic Scale In Feet

TITLE:

Burn Site
Proposed Monitoring Well Location
And Surface Water Location Map

PROJECT:

Sherwin-Williams Gibbsboro
Remedial Investigation

CLIENT NAME:

The Sherwin-Williams Company

WESTON SOLUTIONS

DATE: February 2010

FIGURE #: 5

L:\SHERWIN\GIS\MXD\0110_Burnsite\07573_BS_Prop_MW_SW_Loc.mxd

Attachment 6:

"Figure 5 - Burn Site - Groundwater Samples - Round 1 (August 2005) and Round 2 (September/October 2005) - Exceedances (All Parameters)"

This figure is excerpted from the June 19, 2006 report entitled "*Evaluation of Strategic Sampling Results, U.S. Avenue Burn Site and Associated Reaches of Honey Run and White Sands Branch*".

WESTON SOLUTIONS SM

Weston Solutions, Inc.
205 Campus Drive Edison, New Jersey 08837-3939
TEL: (732) 417-5800 Fax: (732) 417-5801
http://www.westonsolutions.com

SHERWIN WILLIAMS — COVER THE EARTH

REPORT DATE: AUGUST 2009	PROJECT MANAGER: S. JONES
DRAWING: 06958_BS_GW_Exceedances.apr PATH: L:\SHERWIN\GIS\Apr\0606_Burn_Site\	CHECKED BY: A. FISCHER
REVISION No. 0	CONTRACT No. DELIVERY ORDER NO.
WORK ORDER No. 20076.022.073.0005	DRAWN/MODIFIED BY: A.SALAZAR DATE CREATED: 08/11/2009

CLIENT NAME: The Sherwin-Williams Company

PROJECT NAME: Sherwin-Williams Gibbsboro Remedial Investigation

DRAWING TITLE:

BURN SITE GROUNDWATER SAMPLES ROUND 1 (AUGUST 2005) AND ROUND 2 (SEPTEMBER/OCTOBER 2005) EXCEEDANCES (ALL PARAMETERS)

[REVISED WELL LOCATIONS]

FIGURE: 5 | SCALE: 1" = 100' | DATE: 08/14/2009